

Electric transportation systems to expand: EPRI

PALO ALTO, CA—More than 45 percent of those questioned in a recent survey of electric utilities say they have plans to expand or introduce electric transportation (ET) systems in their service areas.

The Electric Power Research Institute conducted a survey of 85 electric utilities to determine industry involvement and awareness of ET alternatives.

The systems include electric cars and trucks, electric hybrid vehicles, fuel cell electric vehicles, electrified highways, electric buses, electric rail transit, personal rapid transit, dual mode transit, automated guideway transit and electrified railroads.

In a report on the survey findings EPRI said, "An important factor motivating utility interest support for ET development is that it represents a significant new market for electricity."

About 75 percent of the utilities surveyed said that some form of electric transportation is currently in use within their service areas. (See chart.) The survey found that almost half of the respondents said electric cars and trucks are being used.

EPRI noted that electric rail transit systems, are operating in 24 percent of the service areas. A small number of utilities reported the use of electric buses, electrified railroads, and a variety of experimental systems.

Of those utilities expressing interest in expanding their ET usage, electric rail transit was mentioned by 27 percent of the participants, followed by electric cars and trucks (19 percent).

"Economic and technical considerations were identified as the primary barriers to broad-based ET use," stated EPRI. "Public awareness and social resistance were also noted, but in general were not viewed as representing a significant barrier to the use of ET systems."

The survey found that new systems face technological and economic barriers. EPRI said many of the respondents stated the need for a propulsion battery with high-energy and high-power capabilities.

Other requirements mentioned that are needed for the expansion of EV use are a promotional network, qualified service facilities, convenient battery charging, and the availability of a warranty backed by a 'name' manufacturer.

Utilities are extremely interested in being kept informed about the state of the art (89 percent). Of the companies supporting EPRI's research, 83 percent encouraged the institute to expand its ET research program.

In response to the survey findings, EPRI said it has begun an assessment of electric hybrid vehicle options.

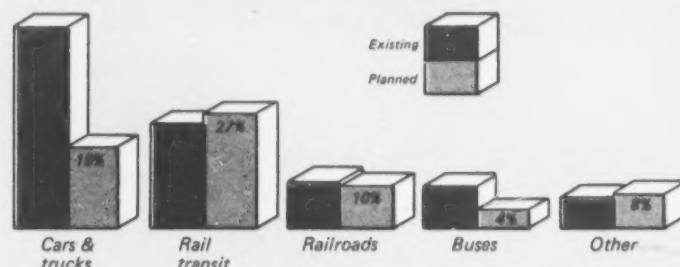
It also has started an Advanced Transportation Systems (ATS) Working Group made up of electric utility representatives.

The working group will evaluate ATS alternatives and make recommendations to EPRI on promising development and demonstration opportunities.

Next year, EPRI plans to form a centralized ATS information service that will be used to keep the utility industry informed about ATS technology and market achievements.

For more information on the survey and EPRI's ET program, call EPRI Program Manager Lawrence O'Connell at (415) 855-2644.

PERCENT OF UTILITIES WITH ET SYSTEMS IN-USE OR PLANNED



Source: Electric Transportation Alternatives Survey—EPRI, Summer 1986.

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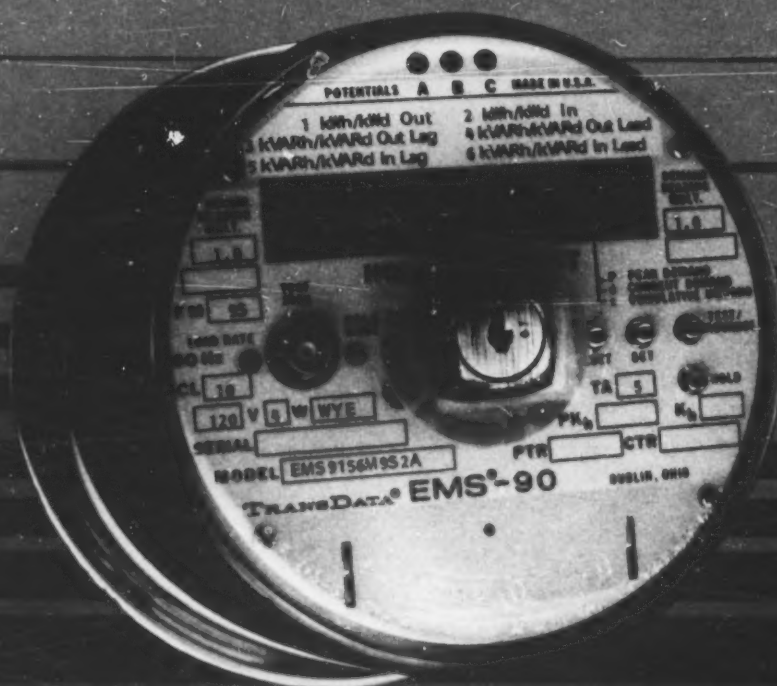
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SDG&E system tracks its line-crew 'call-outs'

SAN DIEGO—San Diego Gas & Electric Co. has developed a new system for keeping track of emergency crew call-outs to restore service. The system was designed for district office use and replaces a centralized system that had been kept on SDG&E's main-frame computer.

The system, which was written in dBase III, was designed to run on personal computers and is completely menu-drive, making it usable to anyone familiar with personal computer operation, according to Frank Armbrust, office supervisor for Northeast construction operations.

Electric Light & Power

THE NEWS MAGAZINE OF ELECTRIC UTILITY MANAGEMENT AND TECHNOLOGY

A CAHNERS PUBLICATION

TVA's Bull Run station ranked most efficient in 1985: UDI

WASHINGTON—Tennessee Valley Authority's coal-fired Bull Run plant was the most efficient generating station in the U.S. in 1985, according to a new report from the Utility Data Institute.

The plant had a heat rate of 8900 Btu per kWh. Bull Run was followed by 1984's leader, Massachusetts Municipal Wholesale Electric Company's Stonybrook combined cycle plant, at 9023 Btu/kWh. Duke Power's Marshall station came in third at 9051 Btu/kWh.

UDI's report differs from *Electric Light & Power's* annual August list. The UDI report looks at total plant or unit heat rate, while EL&P's examines individual unit heat rates.

The UDI study contains top 100 electric utility rankings on heat rate, production expense and net output. The top 20 plants, ranked by heat rate and production expense, are shown in the tables.

For the first time, UDI has includ-

ed a directory of U.S. power plant managers in the report. Names, addresses and telephone numbers are arranged by state and by utility company within each state.

Nine of the top ten most efficient plants are coal-fired. United Illuminating Company's New Haven Harbor plant had the lowest heat rate among oil-fired plants (9576 Btu/kWh). West Texas Utilities Company's Oak-Creek station had the lowest heat rate among gas-fired plants (9789 Btu/kWh).

UDI's database of 672 plants represents about 97 percent of the electricity generated by steam electric plants in the U.S. in 1985. The plants represent a total capacity of 516 GW. Data in the report was compiled from FERC Form 1s, EIA Form 412s and REA Form 12Ds.

Of the 100 most efficient plants, UDI said that 83 are coal-fired, 6 oil-fired, 9 gas-fired and 2 combined-

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Employees 'earned' MP's award

Calling Minnesota Power's selection as Electric Utility of the Year "a tribute to the hard work and dedication of our employees," MP Chairman and CEO Jack F. Rowe (l) accepted *Electric Light & Power* magazine's award from Robert A. Lincicome (r), *EL&P* Editor-in-Chief, at a special luncheon presentation in Duluth on October 31. The Minnesota utility was the 18th company to be selected to receive the magazine's annual award.

Canada connection dedicated

MONROE, NH—Canadian hydroelectric power began flowing into New England in October through a new interconnection that is expected to save the region's consumers about \$600 million.

New Hampshire Gov. John Sununu, Vermont Gov. Madeleine Kunin, and Quebec Prime Minister Robert Bourassa joined New England and Quebec utility representatives at a dedications ceremony for Phase I of the New England/Hydro-Quebec Interconnection at the Comerford Station Converter Terminal here.

Another milestone

New England Power Pool Executive Committee Chairman Steven J. Sweeney called the project "another

milestone in NEPOOL's successful fuel diversity program."

The Phase I interconnection will bring about 3 billion kilowatt hours from northern Quebec to New England annually between 1986 and 1997 on a DC line that will operate at 450-kV. The line has a 690 MW capacity. According to NEPOOL, that will meet approximately four percent of the region's projected electrical needs over the next decade.

With the addition of the proposed Phase II project in 1990, the interconnection is expected to provide 10 billion-kWh in 1991, or 10 percent of the region's annual electric demand. The current 107-mile direct current transmission line will be extended 133 miles into Massachusetts.

Owners decide to scrap Seabrook-2, sell equipment

SEABROOK, NH—Owners of the Seabrook nuclear plant announced in November that the partially-completed Unit 2 will be scrapped.

New Hampshire Yankee said the owners have authorized management to begin the sale of all salvageable components and equipment from the unit.

In addition, New Hampshire Yankee said the 16 owners will be returning the unit's construction permit to the Nuclear Regulatory Commission.

Work on Unit 2 was 25 percent complete when it was halted in 1984. Since that time, the utility said funds have been spent only to preserve and protect the equipment and components. Approximately \$800 million, including financing costs, have been spent on the unit.

Public Service Company of New Hampshire, which owns 35.6 percent of both Seabrook units, took a \$300 million write-off for its investment in the unit earlier this year.

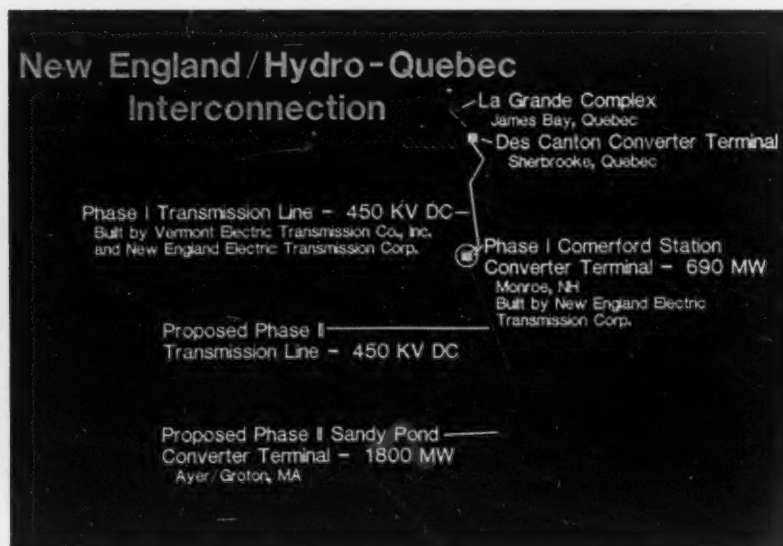
New Hampshire Yankee Senior Vice President William Derrickson said he expects electric utilities with plants similar to Seabrook will be interested in buying the components and equipment.

"Unit 2 equipment represents a substantial investment for our owners," he said, "and a realistic look at all of the option regarding Unit 2 has shown that the marketing of saleable equipment and components to be in the best interest of our owners, their ratepayers and investors."

Seabrook Unit 1, which is nearly finished but not licensed, is involved in controversy over its emergency evacuation plans.

Massachusetts Gov. Michael Dukakis has said the state will not participate in the development of an emergency response plan for the projects.

Despite that, New Hampshire Yankee President Edward A. Brown said he is confident the plant will be licensed.



Dedication ceremonies were held in October at the Comerford Station Converter Terminal in Monroe, NH for the New England/Hydro-Quebec Interconnection, which has begun bringing Canadian hydroelectric power to New England.

Transmission access: Next major battle for utilities?

WASHINGTON—A DOE official has warned a joint utility/industrial customer group that transmission access may be the next major congressional battle for the electric utility industry. The official, Steven Herod, Director of the Office of Coal & Electricity Policy, said he was speaking as an individual, not a DOE official.

Herod told the Keystone Electricity Working Group, an organization

made up of representatives of some of the nations largest electric and gas, pipeline, petroleum, chemical, mining, metals, automotive and manufacturing companies, consulting engineers and research organizations, that he envisions utility customers bringing pressures to bear on their congressional representatives to get them a way to shop for and buy power

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Catawba lowest cost U.S. nuclear plant since '84: Duke Power

● Duke Power Co. reported that its Catawba nuclear station is the nation's lowest cost nuclear power plant to come into service since 1984. Warren H. Owen, executive vice president-engineering, construction and production group at Duke Power, attributes a large part of the success to a coordinated interdepartmental effort begun in 1982. He said the program enabled the company to reduce Catawba's projected cost of \$1,703 per kilowatt to \$1,560 per kilowatt. "At \$1,560 per kilowatt, Catawba's cost is the lowest of the 19 nuclear plants that either have entered service since June 1984 or are scheduled to by June 1988—and about one-half the average," stated Owen.

'Watt busters' help NY Power Authority conserve energy



New York Power Authority Chairman Richard M. Flynn, center, joins the Watt Busters, specially-trained energy auditors, for the kickoff of an \$800,000-energy conservation pilot program. The Power Authority and local electric departments are implementing the program to cut energy waste and consumer electric bills in the central New York communities of Skaneateles and Groton, according to the utility.

Philippines cancels only nuclear power plant, sells fuel

● The Philippines has announced it will cancel its only nuclear power plant and will put its uranium fuel, worth \$250 million, up for sale, according to the Chicago Sun-Times. The \$2.2 billion plant, built by Westinghouse, was delayed when Corazon C. Aquino took over in February. Intended to supply power to the main island of Luzon, the plant had caused controversy because it was located by a dormant volcano. Philippines Presidential press secretary Teodoro Benigno said that three parties had already put in offers to buy the uranium fuel, but that the government was still trying to obtain U.S. consent to sell it.

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EL&P readers whose responsibilities include both Generation and Transmission Distribution receive both technology sections. Other readers receive the technology section that applies to their respective area of responsibility. The Generation edition is indicated by a single dot (•) in the upper right corner of page 1. The T/D edition carries two dots (••). All readers receive EL&P's industry news section.

TMI-1 shut down for refueling

● According to GPU Nuclear Corporation, Three Mile Island Unit 1 has been shut down for reactor refueling. The company said that while the unit is shut down, NRC-required modifications to its fire protection system will be completed and turbine maintenance work will be done. GPU Nuclear expects the outage to last for about five months and said it will involve over 1,000 workers. Refueling is scheduled to begin this month and be completed by the end of January, according to the company.

OG&E asks commission for a \$50 million rate reduction

● Oklahoma Gas and Electric Co. (OG&E) requested a \$50.2 million, or 5.2 percent, rate reduction from the Oklahoma Corporation Commission. The utility asked that the reduction be granted in two phases. Phase I, effective January 1, would be for \$17.4 million, and Phase II, to be implemented July 1, would total \$32.8 million. "Changing economic conditions, the new federal tax law and our own aggressive cost-saving activities have combined to make this rate reduction possible," said OG&E Chairman and President James G. Harlow, Jr.

Nine Mile-2 completes fuel load steps, receives NRC license

● Niagara Mohawk Power Corporation said it has met the final steps required for loading of uranium fuel at its Nine Mile Point Nuclear Unit Two. After installing and successfully testing four of the main steam isolation valves, the utility received a license from the Nuclear Regulatory Commission to operate at up to five percent power while systems are carefully tested. Niagara Mohawk Senior Vice President Charles V. Mangan said the fuel-load process would take approximately five weeks and that the company will then apply for a full power license.

Seabrook Unit 1 fuel load license authorized by NRC

● Public Service Company of New Hampshire has been granted a license, by the Nuclear Regulatory Commission (NRC), to load fuel into Unit 1 of its Seabrook Station and to conduct non-nuclear testing, according to NRC. Seabrook Units 1 and 2 will use pressurized water reactors, said NRC, and each will produce 1150 MW at full power. The commission reports that construction of Unit 2 has been delayed and no completion date has been set.

NRC issues operating license to Edison's Braidwood 1

● The Nuclear Regulatory Commission has issued an operating license to Unit 1 of Commonwealth Edison Co.'s Braidwood generating station, according to the utility. Edison said the license allows fuel to be loaded at Braidwood, which is expected to take several weeks, and conduct non-nuclear reactor tests. Issuance of the license followed a recommendation by the Atomic Safety and Licensing Board that Edison be allowed to load fuel at the site (see November EL&P page 2). A low power license is not expected until a decision is reached in the licensing hearings which, Edison hopes, will occur in January.

Detroit Edison division breaks safety record, receives award

● Detroit Edison has announced that the 280 employees in its Ann Arbor division recently reached a company safety record by working over 1 million hours without a disabling injury. As a result, the division received the Edison Electric Institute's Safety Achievement Award. "No other Detroit Edison division has ever achieved a safety record of this magnitude...in only two years our division has realized the best safety-record improvement in the company."

Spray dryer plant dedicated



A 10 MW spray dryer/electrostatic precipitator pilot plant that promises clean burning of high-sulfur, eastern U.S. coal was dedicated Oct. 17 at the TVA Shawnee Fossil Plant near Paducah, Kentucky. Sponsors of the project include TVA, the Electric Power Research Institute, the Commonwealth of Kentucky and Ontario Hydro. Officials from all the organizations took part in the ceremonies, including Kentucky Gov. Martha Collins (at lectern). TVA Manager of Power Robert C. Steffy, Jr., said, "The SD/ESP process appears to offer economic and operational advantages for retrofitting on systems like TVA fossil plants that burn medium- and high-sulfur coal. The test will be conducted over a three year period."

Bull Run ranked most efficient . . . from page 1

cycle plants. No nuclear plants were included because of the variability among utilities in reporting fuel consumption and heat content of nuclear fuel.

Least expensive producer

Every year since 1981 and again in 1985 West Texas Utilities Company's Rio Pecos gas-fired plant has been the least expensive producer of electricity. The second, third and fourth plants on the list—Union Electric's Callaway 1, Virginia Power's North Anna and Niagara Mohawk's Nine Mile Point 1—are all nuclear. Rounding out the top ten are three coal plants and three more nuclear plants. On average, noted UDI, 15 of the top 25 plants in the group's annual rankings of variable production costs over the last five years have been nuclear-fueled.

Of the top 100 plants that generated the least expensive electricity, 67 are coal-fired, 31 are nuclear and 2 are gas-fired. No oil-fired plants made the list.

Of the 672 total plants, the 60 nuclear plants had the lowest average production expense at \$18.67 per MWhr. Next came the 402 coal stations at \$22.60 per MWhr, the 152 gas-fired plants at \$42.33 per MWhr, and the 51 oil-fired plants at \$52.82 per

MWhr. The seven units using "other" fuels had average expenses of \$44.52 per MWhr. Average oil and gas production expenses declined slightly from 1984 levels, while the others increased.

Lowest fuel expense

Nuclear units came in with the lowest average fuel expense at \$7.51 per MWhr, while the oil-fired plants had the highest at \$46.38 per MWhr.

UDI said average production expenses for the entire group were \$25.39 per net MWhr and average fuel expenses were \$19.72 per net MWhr.

Also in the report is a comparison of 1984 and 1985 expenses for a selected group of large steam electric plants.

According to the report, utilities spent more than \$53 billion in 1985 to operate and maintain the 672 plants. Of that total, UDI said \$41.3 billion can be attributed to fuel costs.

For more information

For more information on the report, contact UDI at (202) 466-3660.

UDI is a private, not-for-profit information services company located in Washington, D.C., which has tracked and computerized capital and operating expenses for utilities and their power plants since 1981.

WEPCO forms holding company

MILWAUKEE—Wisconsin Electric Power Co. shareholders voted October 29 to reorganize into a holding company called Wisconsin Energy Corporation.

The company will create new non-utility subsidiaries aimed at increased emphasis on economic development programs.

Approval must be granted by the Securities and Exchange Commission before the change can take effect. WEPCO said it hopes to gain approval before year's end.

"Today's action puts us only one step away from a new organization that we believe can make a major contribution to economic development in our state," said Chairman Charles McNeer.

Under the new plan, Wisconsin Energy Corp. would become the parent company of Wisconsin Electric, Wis-

consin Natural Gas Co., and several nonutility subsidiaries.

"These nonutility subsidiaries will be a logical extension of our recent economic development efforts," said McNeer. "While we plan to move slowly, we anticipate that these ventures will mean new jobs in our service area, an increased tax base and a stronger economy over the next decade."

He emphasized that the electric and natural gas subsidiaries will continue to be the top priority and key businesses for the company.

Said McNeer, "The utility industry has changed and we expect that trend to accelerate in the next decade with increasing competition, development of new technology and changing regulatory requirements. It will be a time of great opportunity and exciting challenges."

Regulator warns colleagues not to be overzealous in protecting the public

LAS VEGAS—Utility regulators need to watch their tendency to be overzealous in protecting the public, according to a Wisconsin Public Service Commission member.

Branko Terzic, who has served as a commissioner since 1981, said utility regulation can be too profit conscious.

"I am coming more and more to the conclusion that we are not taking advantage of the best of the American spirit of competition and free enterprise in many regards," he noted at an October seminar on regulation sponsored by the Utility Shareholders Association of Nevada.

Regulators at risk

Regulators are at risk, said Terzic, if they pay too much attention to limiting utility profits and not enough attention to the cost involved in providing utility services.

"We end up with a real disincentive for innovation, for managerial efficiency," he stated.

When utilities operate efficiently

with rate caps, Terzic said that regulators give them no incentive to keep being efficient. In fact, he noted, it becomes a disincentive to become innovative and lower costs.

"I am firmly of the opinion that citizens would rather pay an \$80 bill with a 23 percent return on equity than a \$100 bill with a 12 percent return on equity," said Terzic.

The future key will be to find some mechanisms which will allow costs to come down and at the same time, stated the regulator, allow managers and shareholders to share the benefits of improved efficiencies.

He admitted that regulators have a hard time determining cost factors involved in providing service.

"We do, however, do a much better job at regulating the rates of return and opportunity for that return," he said. "Out of a \$100 utility bill, about \$2 or \$3 is returned and most commissions will spend 80 percent of their time discussing the return figure rather than the cost figures."

No.	Plant or unit	Heat rate (Btu/kwh)	Operator	Primary fuel type	1985 installed capacity (MW)	1985 net generation (MMwhrs)
1	Bull Run	8900	Tennessee Valley Auth.	Coal	950	5,292,978
2	Stonybrook	9023	Mass. Muni. Whsl. Elec. Co.	CCYC	358	794,040
3	Marshall (NC)	9051	Duke Power Co.	Coal	1,998	9,168,595
4	Belews Creek	9067	Duke Power Co.	Coal	2,160	11,472,489
5	JH Campbell	9246	Consumers Power Co.	Coal	1,420	8,663,179
6	Crystal River 4&5	9283	Florida Power Corp.	Coal	1,479	8,573,324
7	McMeekin	9357	South Carolina Elec. & Gas	Coal	294	1,889,012
8	Gallatin	9380	Tennessee Valley Auth.	Coal	1,255	6,948,174
9	Amos	9382	Appalachian Power Co.	Coal	2,933	17,320,017
10	Bay Shore	9402	Toledo Edison Co.	Coal	639	3,794,644
11	Morgantown	9416	Potomac Electric Power Co.	Coal	1,252	5,405,124
12	Clinch River	9450	Appalachian Power Co.	Coal	713	3,610,499
13	Milliken	9462	New York State Elec. & Gas	Coal	316	1,732,889
14	Somerset 1	9473	New York State Elec. & Gas	Coal	655	4,736,214
15	John Savier	9480	Tennessee Valley Auth.	Coal	800	5,280,647
16	Philip Sporn	9487	Central Operating Co.	Coal	1,106	4,182,309
17	Coletto Creek	9496	Central Power & Light Co.	Coal	600	4,002,559
18	Mountaineer	9512	Appalachian Power Co.	Coal	1,300	7,073,740
19	Muskingum River	9543	Ohio Power Co.	Coal	1,530	7,298,746
20	Monroe (MI)	9555	Detroit Edison Co.	Coal	3,280	19,810,292

Source: "1985 Production Costs, Operating Steam Electric Plants," Utility Data Institute.

No.	Plant or unit	Average expenses/ net MWhr	Operator	Primary fuel type	1985 installed capacity (MW)	1985 net generation (MMwhrs)
1	Rio Pecos	4.51	West Texas Utilities Co.	Gas	142	1,023,429
2	Callaway 1	7.85	Union Electric Co.	UR	1,238	8,029,574
3	North Anna	9.56	Virginia Elec. & Power Co.	UR	1,959	12,612,515
4	Nine Mile Point	9.75	Niagara Mohawk Pwr. Corp.	UR	642	4,932,333
5	Hayden	10.58	Colorado-Uta Elec. Assn.	Coal	465	3,117,627
6	MR Young	10.86	Minnesota Power Coop.	Coal	682	4,021,000
7	Laramie River	11.69	Basin Electric Power Coop.	Coal	1,710	9,516,334
8	Monticello	11.77	Northern States Power Co.	UR	559	4,286,986
9	Point Beach	12.23	Wisconsin Elec. Power Co.	UR	1,048	6,955,765
10	Quad Cities	12.43	Commonwealth Edison Co.	UR	1,857	10,629,185
11	Prairie Island	12.54	Northern States Power Co.	UR	1,186	7,285,464
12	Trojan	12.55	Portland General Elec. Co.	UR	1,216	8,910,774
13	Wolf Creek 1	12.56	Kansas Gas & Elec. Co.	UR	1,236	2,942,100
14	Surry	12.61	Virginia Elec. & Power Co.	UR	1,695	9,690,725
15	Monticello (TX)	13.04	Texas Utilities Elec. Co.	Coal	1,980	13,159,790
16	Colstrip	13.04	Montana Power Co.	Coal	1,495	7,510,802
17	Zion	13.32	Commonwealth Edison Co.	UR	2,196	9,927,984
18	Maine Yankee	13.34	Maine Yankee Atomic Pwr.	UR	864	5,354,407
19	Pirkey 1	13.41	Southwestern Elec. Pwr. Co.	Coal	640	3,002,549
20	Calvert Cliffs	13.61	Baltimore Gas & Elec. Co.	UR	1,828	9,925,994

Source: "1985 Production Costs, Operating Steam Electric Plants," Utility Data Institute.

Acid rain legislation poses threat to clean coal technologies

ST. LOUIS—New clean coal technologies are threatened by the possibility of acid rain legislation.

National Coal Association President Carl H. Bagge told delegates to the first International Clean Coal Technology here in October that the forced reduction of SO₂ emissions and mandatory scrubbing would not bring about a corresponding reduction in acid rain.

Instead, Bagge said, "It would prevent the wide commercial application of the clean coal technologies, which are more economic in capitalization and construction because they can be built in increments closely paralleling the need."

The emerging coal combustion technologies are more efficient than scrubbers because they do not drain off significant amounts of electricity to power controls, he said.

"And because they offer more Btu's for the buck, and more kilowatts for the Btu's, they will contribute to general economic strength," noted the NCA president. "If emissions are really the concern, new technologies are cleaner than things that an acid rain law would force in their place."

Bagge told the conference attendees that clean coal technology needs

only a push to foster development. Because of the new technologies, he said that electric generation is poised at the frontier of a new era.

Some of that impetus is already coming from the states, pointed out Bagge. "Some of them are hard pressed, and it is significant they are putting up half of the required clean coal investment. They have given the probabilities a hard-eyed assessment and they are applying the nudge."

Aluminum industry troubles may affect NW economy, ratepayers

RICHLAND, WA—The results of a recent study, conducted for the Bonneville Power Administration (BPA), found that financial troubles facing the aluminum industry may severely affect segments of the Northwest economy and electricity ratepayers.

According to Battelle Memorial Institute, the Northwest economy could lose more than 30,000 jobs and \$136 million in annual tax revenues if the aluminum industry's problems cause the shutdown of the region's remaining smelters.